FACULTY OF ENGINEERING AND
INFORMATION TECHNOLOGY

Novel Models in Recommender Systems and Group Recommender Systems for Improving Recommendations

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A thesis submitted for the Degree of
Doctor of Philosophy

University of Technology Sydney

Certificate of Authorship/Originality

I, Jorge Castro declare that this thesis, is submitted in fulfilment of the requirements for the award of Doctor of Philosophy in the Faculty of Engineering and Information Technology at the University of Technology Sydney.

This thesis is wholly my own work unless otherwise reference or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis. I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of the requirements for a degree except as fully acknowledged within the text.

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ABSTRACT

This thesis focuses on the improvement of recommendations within personalization processes applied to support users overcome the information overload problem. This thesis focuses on two aspects: group recommendation and context-aware recommendation. The first block of the thesis proposes four group recommendation models to overcome each of the following limitations of previous techniques: (i) loss of information and diversity due to the aggregation of ratings in a group profile, (ii) lack of techniques that consider the changes in users' behavior when gathering in groups through consensus reaching processes, (iii) lack of techniques that consider the influences among members' preferences in group recommendation, and (iv) lack of natural noise management techniques for group recommender systems. The second block of the thesis focuses on the integration of contextual information in individual and group recommendation models. Within this block, a context-aware recommendation model for the recommendation in the question answering domain is proposed, which considers the collaborative trend interest as the recommendation context. The second model within this block integrates context-aware and group recommendation extending a consensus-driven group recommendation model.

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